



Apple Ethernet 10T/5 Workgroup Hub User's Guide

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Communications regulation information

FCC statement

This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the Federal Communications Commission (FCC) rules. These limits are designed to provide reasonable protection against such interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio-frequency energy and, if not installed and used in accordance with the instructions in this manual, may cause interference to radio communications. Operation of this equipment in a residential area is likely to cause interference, in which case the user, at the user's own expense, will be required to correct the interference.

IMPORTANT Changes or modifications to this product are not authorized by Apple Computer, Inc., and could void the FCC certification and negate your authority to operate the product. This product was tested for FCC compliance under conditions that included the use of shielded cables and connectors between system components. It is important that you use shielded cables and connectors to reduce the possibility of causing interference to radios, television sets, and other electronic devices. For Apple peripheral devices, you can obtain the proper shielded cables through an Apple-authorized dealer. For non-Apple peripheral devices, contact the manufacturer or dealer for assistance.

DOC statement

DOC Class A Compliance

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the radio interference regulations of the Canadian Department of Communications.

Observation des normes—Classe A

Le présent appareil numérique n'émet pas de bruits radio-électriques dépassant les limites applicables aux appareils numériques de la Classe A prescrites dans les règlements sur le brouillage radioélectrique édictés par le Ministère des Communications du Canada.

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取扱説明書に従って正しい取り扱いをして下さい。

CE statement

This equipment generates, uses, and may radiate radio-frequency energy and if not properly installed and used in accordance with the instruction manual may result in interference to radio communications.

This equipment has been designed, tested, and found compliant with the Class A limits for Information Technology Equipment of EN55022. These limits are designed to provide reasonable protection against radio interference when the equipment is operated in a commercial environment.

In a residential environment this equipment may cause unacceptable levels of radio interference, in which case the user may be required to correct the interference.

This guide tells you how to use the Apple Ethernet 10T/5 Workgroup Hub to connect Apple computers and peripheral devices to create or expand an Ethernet network. The hub conforms to the IEEE 10BASE-T standard for implementing Ethernet over Category 3 or Category 5 unshielded twisted-pair cable.

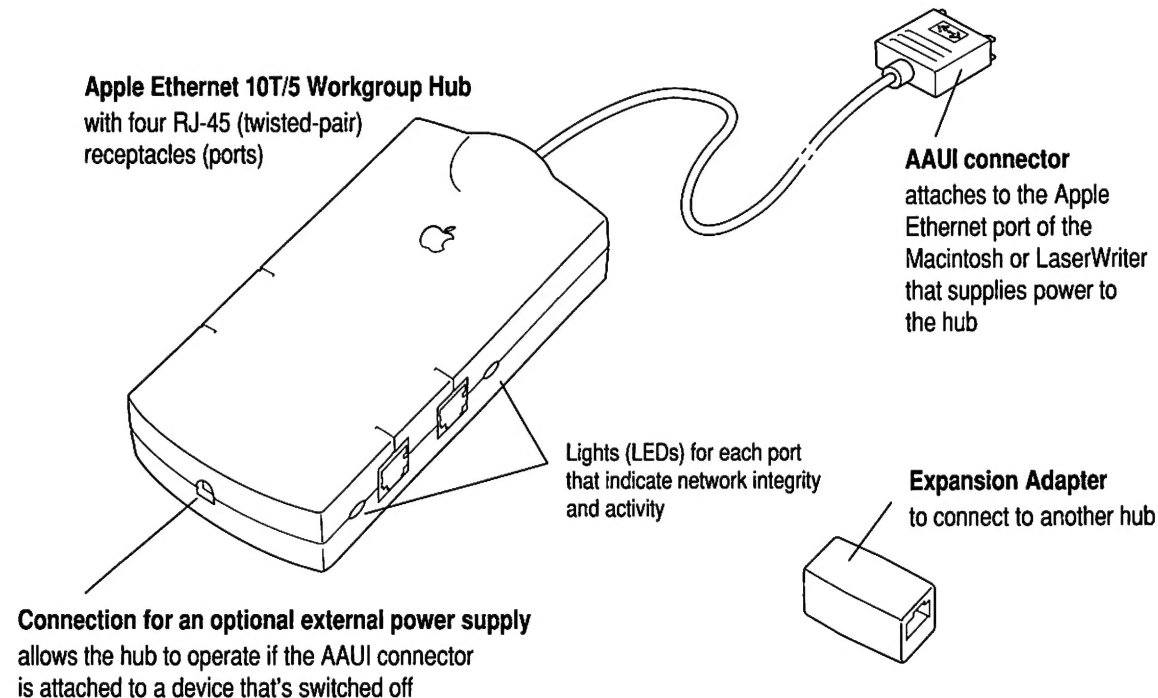
About the Apple Ethernet 10T/5 Workgroup Hub

The Apple Ethernet 10T/5 Workgroup Hub is part of the Apple Ethernet Cable System family of products. The hub provides a modular, plug-and-play approach to creating and expanding high-performance (ten megabits per second) Ethernet networks. The hub gives you a simple, cost-effective means of connecting together a wide variety of Macintosh computers, Workgroup Servers, other personal computers, and Ethernet-capable printers. All Apple Ethernet products conform to the IEEE 802.3 standard for Ethernet, so they can easily work with Ethernet products from other vendors. The hub (also called a *repeater* or *concentrator*) allows you to create or expand an Ethernet network that uses IEEE 802.3 10BASE-T standard twisted-pair cable.

With the Workgroup Hub and Ethernet-capable computers and printers, you have the basis for creating a 10BASE-T Ethernet network. Apple computers and printers provide Ethernet connectivity through the Apple Ethernet port (also known as the *AAUI port*). Some Macintosh computers, including Power Macintosh, Macintosh Quadra, and Workgroup Server computers, and LaserWriter IIg and LaserWriter Pro 630 printers come with built-in Ethernet. This connection port is also available through the installation of an Apple Ethernet NB Card, an Apple Ethernet LC Card, an Apple Ethernet CS AAUI Card, or other hardware product that provides an equivalent Apple Ethernet port.

See page 3 for information on the other hardware ingredients you need to create a network with the Workgroup Hub.

What's in the box...



What else you need...

Ethernet 10BASE-T-compliant RJ-45 ports

You can connect users and other network devices to the hub by using standard twisted-pair cards, transceivers, and cabling. These are among the compatible cards and transceivers that you can use to connect your Macintosh computer to the Workgroup Hub:

- Apple Ethernet LC Twisted-Pair Card (Order No. M2460Z/A)
- Apple Ethernet CS Twisted-Pair Card (Order No. M3065Z/A)
- Apple Ethernet NB Twisted-Pair Card (Order No. M1768Z/A)
- Apple Ethernet Twisted-Pair Transceiver (Order No. M0437Z/B)

Cabling

The Workgroup Hub provides four twisted-pair ports (called *RJ-45 receptacles*) that accept industry-standard Category 3 or Category 5 10BASE-T Ethernet twisted-pair cabling. Each cable segment (the length of cable between the hub and the computer or printer) can be a maximum of 100 meters (328 feet).

These Apple Ethernet Twisted-Pair Cables are available:

- 3-meter twisted-pair cable (Order No. M3348Z/A)
- 7-meter twisted-pair cable (Order No. M3349Z/A)
- 13-meter twisted-pair cable (Order No. M3350Z/A)

If you connect the Workgroup Hub to another 10BASE-T hub, and the other hub doesn't have an uplink port, then you need to use either the Expansion Adapter provided with the Workgroup Hub or a crossover cable. Both the Expansion Adapter and the crossover cable serve to cross the receive and transmit (input and output) signals.

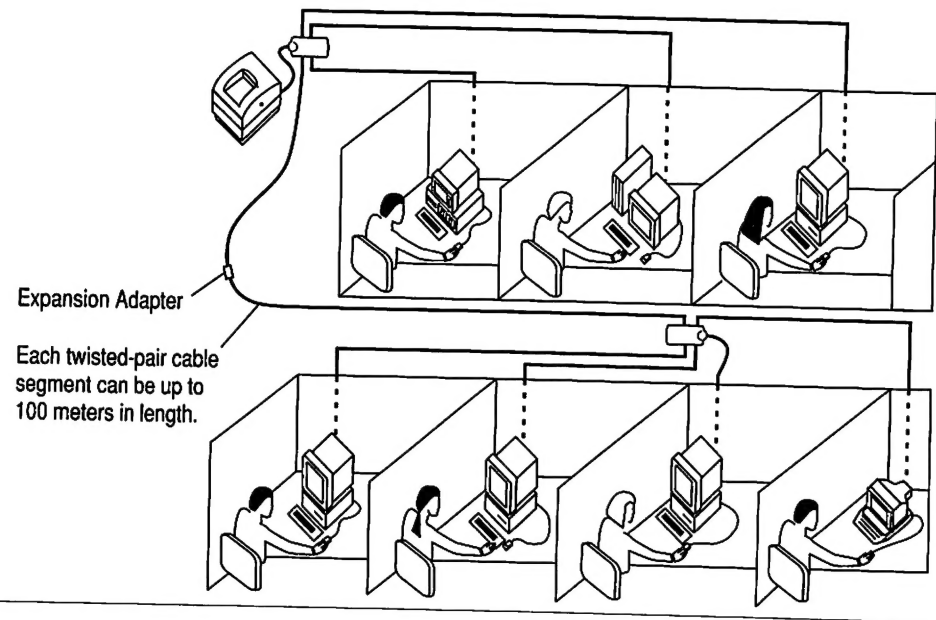
If you use the Expansion Adapter, you must use standard twisted-pair cable. If you use crossover cable, don't use the Expansion Adapter. To obtain crossover cable, see your network administrator. For more information about connecting hubs together, see page 8.

Optional power supply

You can use the AC Adapter for QuickTake 100 (Order No. M2851LL/A) to power the hub. This power supply, also known as the Apple Low-Power AC Adapter, allows the hub to operate even when the device connected to the AAUI connector is switched off.

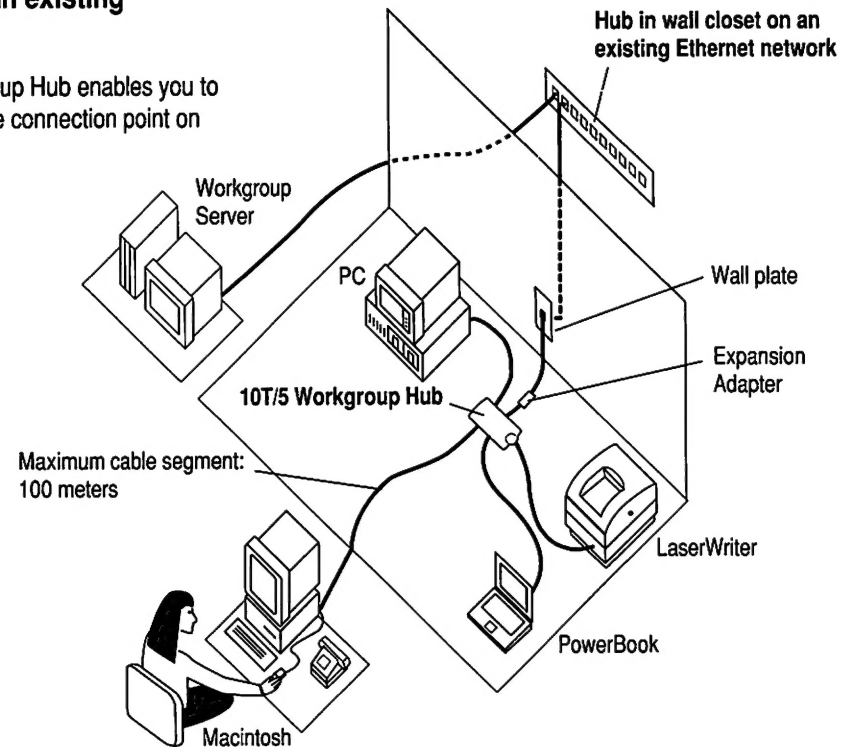
Creating a small network

Each Apple Ethernet 10T/5 Workgroup Hub enables you to connect up to five devices (computers and printers) into a network. You can expand the network by connecting multiple hubs together, using the Expansion Adapter included with the hub.



Expanding and extending an existing Ethernet network

The Apple Ethernet 10T/5 Workgroup Hub enables you to connect multiple devices to a single connection point on an existing Ethernet network.

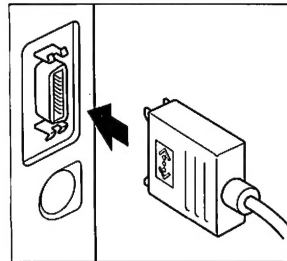


Connecting your Workgroup Hub

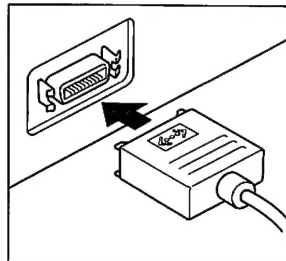
Step 1

The first step in setting up the hub is to connect it to a power source. Power for the hub can come through either of two sources: the Apple Ethernet (AAUI) connector, or through an optional external AC power adapter. If you use the AAUI connector to provide power, it's usually best to connect it to the computer or printer that spends the most time switched on.

Connect the Apple Ethernet connector on the hub to the Apple Ethernet port on the computer or printer that will serve as the power source for the hub. After you connect the hub, all lights on the hub should flash once.



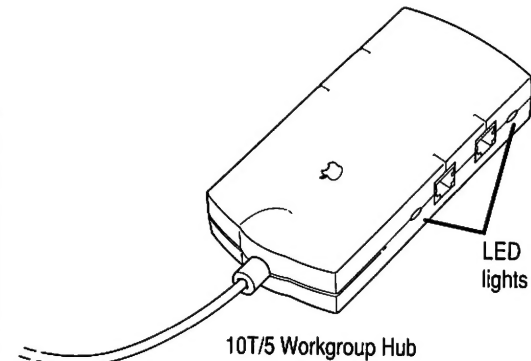
Ethernet card



Built-in Ethernet port

If you use the external AC adapter, then the hub network will continue to function even when the computer or printer attached to the AAUI connector is switched off.

IMPORTANT The only way to disconnect power completely is to unplug the Apple Ethernet (AAUI) cable and any optional external AC adapter. Make sure that the AAUI connector and at least one end of any external AC adapter are within easy reach so that you can unplug the Workgroup Hub when you need to.

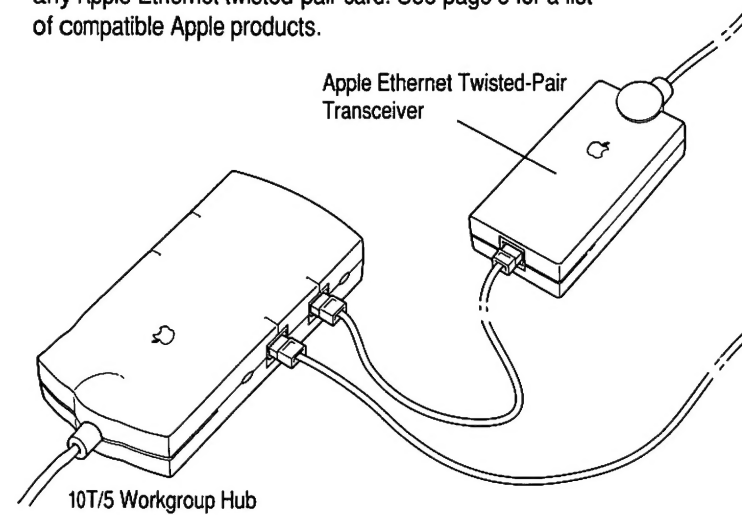


10T/5 Workgroup Hub

LED lights

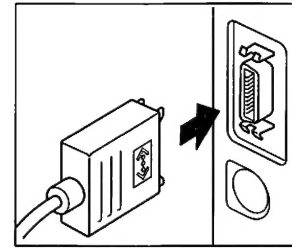
Step 2

After you connect the hub to a power source, you can attach up to four additional devices through the RJ-45 receptacles (ports) on the hub. There are two methods by which you can configure computers and printers for use with a 10BASE-T network. One method is to use the Apple Ethernet Twisted-Pair Transceiver and the other is to use any Apple Ethernet twisted-pair card. See page 3 for a list of compatible Apple products.

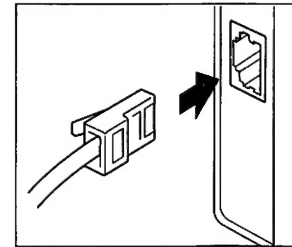


10T/5 Workgroup Hub

Apple Ethernet Twisted-Pair Transceiver



Connecting an Apple Ethernet Twisted-Pair Transceiver to an Apple Ethernet port.



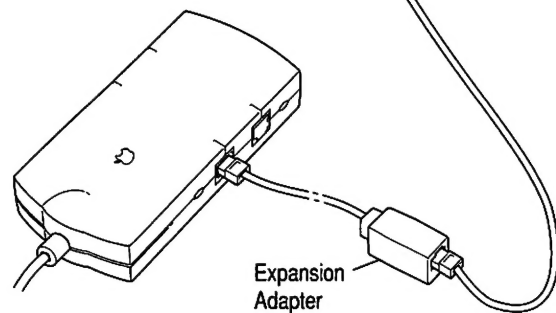
The Apple Ethernet twisted-pair cards provide an RJ-45 port on the back of the computer, enabling you to connect directly from the computer to the hub. When you plug the twisted-pair cable into the RJ-45 receptacle you'll hear a "click."

Connecting multiple hubs

You can expand your network by connecting hubs to each other (sometimes known as *cascading*).

Connecting one Apple Ethernet 10T/5 Workgroup Hub to another

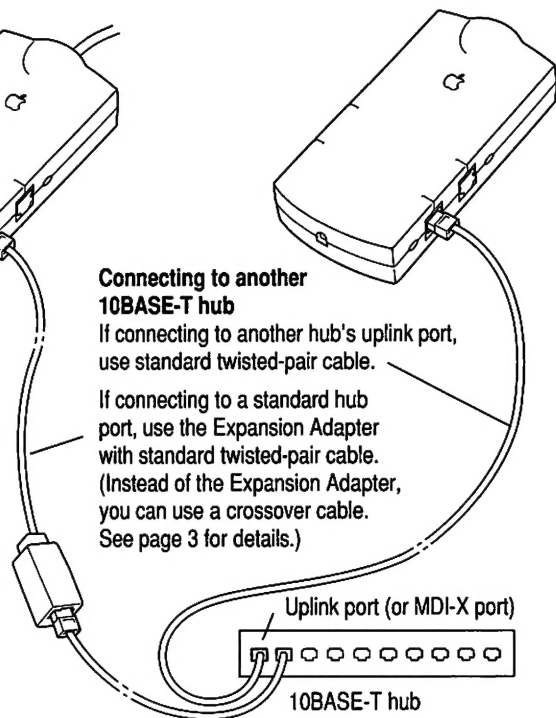
Use standard twisted-pair cable and the Expansion Adapter. (Don't connect two Expansion Adapters on the same cable.)



Connecting to another 10BASE-T hub

If connecting to another hub's uplink port, use standard twisted-pair cable.

If connecting to a standard hub port, use the Expansion Adapter with standard twisted-pair cable. (Instead of the Expansion Adapter, you can use a crossover cable. See page 3 for details.)



Troubleshooting

This section offers some guidelines for handling common problems. For additional assistance, see your network administrator or call Apple at 1-800-SOS-APPL. In Canada call 1-800-263-3394. Outside the United States and Canada, contact your local Apple-authorized reseller.

If none of the devices connected to the hub recognize any of the others:

Check the LEDs next to the connected hub ports. A steady light indicates a good network link between the hub and the device. (These lights flash when data transmits.) If all lights are off, the hub may not have power. Check that the AAUI connector on the hub is connected to a computer or printer that's switched on, or that the optional AC adapter is connected to the hub and a wall outlet.

If you have added a device to the hub but that device is not recognized on the network, or the network seems to be disconnected:

- If the device is a Macintosh computer, does that computer have AppleTalk turned on in the Chooser? Click the button next to "AppleTalk Active" to select it.
- If the device is a Macintosh computer, check that the EtherTalk icon is selected in the Network control panel.
- Be sure that the ends of the network have not been connected together to make a loop.
- Check that there are no more than four hubs connected between any two nodes or devices of the network.
- Check that your overall network has not exceeded the maximum total distance (500 meters/1640 feet).

(continued ➡)

If the problem is with one or more but not all the devices connected to the hub:

Check for secure cable connections between those devices and the hub.

If the device attached to the AAUI connector is not visible on the network, but the other devices connected to the RJ-45 ports are visible:

The AAUI connector or cable may be defective. Try substituting a different hub, or call Apple for assistance.

If the computer with the connection problem has an Ethernet card installed:

If your card has an LED, check that the card's green LED light is on, indicating a good network connection.

Specifications

Connectors

- Four RJ-45 receptacles for attaching to 10BASE-T Ethernet twisted-pair cabling
- One Apple Ethernet (AAUI) connector for attaching to a Macintosh or an Apple printer that provides power to the hub
- External power connector for use with the AC Adapter for QuickTake 100 (Apple Low-Power AC Adapter)

Transmit/receive data rate

- 10 megabits-per-second maximum data rate

Diagnostic displays

- Four LED indicators display Ethernet status (link) and data transmission (one per port)

Environmental requirements

- Operating temperature: 50° to 104° F (10° to 40° C)
- Humidity: 20% to 95% noncondensing

Power dissipation

- Maximum 1.9 W, average 1.5 W

For more information

The following books from Apple Computer, published by Addison-Wesley, are available at computer bookstores.

Understanding Computer Networks gives an overview of networking basics.

Planning and Managing AppleTalk Networks provides comprehensive information on setting up, maintaining, and troubleshooting small- to medium-sized AppleTalk networks.

Inside AppleTalk, second edition, is the definitive technical guide to the protocol architecture of the AppleTalk network system.